

Tyco Docket No. 18060 (20958-2113)

Via Facsimile Transmission 571.273.8300

IN THE CLAIMS

1. (Currently Amended) A connector insertion and removal tool for inserting and removing an electrical connector onto and from a circuit board having opposite first and second surfaces, said tool comprising:

an installation mechanism configured to be positioned proximate the first surface of the circuit board, the installation mechanism being configured to insert the connector onto the first surface of the circuit board such that pins on the connector are inserted into a pin aperture field formed through the circuit board; and

an extraction mechanism configured to be positioned proximate the second surface of the circuit board, the extraction mechanism being configured to remove the connector from the first surface of the circuit board, said installation and extraction mechanisms being coupled to one another;

wherein at least one of said installation and extraction mechanisms comprises an actuator adapted for movement toward and away from the circuit board to insert and remove the connector onto and from the circuit board, said actuator comprising a plurality of extraction pins that are configured to align with ~~a~~ and extend into the pin aperture field that is included on from the second surface toward the first surface of the circuit board, the extraction pins ~~extending into~~ engaging the pins of the connector in the pin aperture field to force the connector from the first surface of the circuit board.

2. (Previously Presented) The tool in accordance with Claim 1 wherein said installation mechanism and said actuator include a groove and rib combination extending toward the first surface to guide said actuator toward and away from said the circuit board during insertion of the connector.

3. (Cancelled)

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4. (Currently Amended) The tool in accordance with Claim 1 wherein at least one of the installation and extraction mechanisms comprises at least one guide pin positioned to extend between the opposite first and second surfaces of the circuit board, said guide pin engaging securing said installation mechanism ~~on to~~ the first surface of the circuit board and engaging securing said extraction mechanism ~~on to~~ the second ~~side surface~~ of the circuit board.

5. (Currently Amended) The tool in accordance with Claim 4-1 wherein said extraction mechanism includes support plates holding said actuator therebetween, said support plates being held stationary against the second surface of the circuit board while the actuator moves toward and away from the circuit board.

6. (Previously Presented) The tool in accordance with Claim 1 further comprising nonconductive sections situated adjacent said actuator, thereby avoiding a conductive path through said tool.

7. (Currently Amended) The tool in accordance with Claim 1 wherein ~~at least one of said installation mechanism and~~ said extraction mechanism comprises an alignment member configured to position the electrical connector with respect to a pin aperture field in the circuit board.

8. (Previously Presented) The tool in accordance with Claim 1 wherein each of said installation mechanism and said extraction mechanism comprises a plurality of modular blocks mounted on and held stationary with respect to the circuit board, and at least one movable block configured to move toward and away from the circuit board.

9. (Previously Presented) The tool in accordance with Claim 1 wherein at least one said installation mechanism and said extraction mechanism comprises a positioning plate configured for sliding engagement with a guide track.

10. (Withdrawn) A connector insertion and removal tool for inserting and removing an electrical connector onto and from circuit board having opposed first and second surfaces, said tool comprising:

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a first portion configured for coupling to the first surface of the circuit board and comprising a first actuator, said first actuator movable toward the first surface of the circuit board to disengage a first connector from the second surface of the circuit board, said first actuator movable away from the circuit board to permit engagement of a second connector to the second surface of the circuit board; and

a second portion coupled to said first portion, said second portion configured to be located proximate the second surface of the circuit board, said second portion comprising a second actuator, said second actuator movable toward the second surface of the circuit board to engage the second connector to the circuit board, and said second actuator movable away from the circuit board to permit disengagement of the first connector from the circuit board.

11. (Withdrawn) A tool in accordance with Claim 10 further comprising a guide pin insertable through the circuit board, said first portion and said second portion engaged to said guide pin on opposite sides of the circuit board.

12. (Withdrawn) A tool in accordance with Claim 11 wherein said first portion comprises a first alignment member for engaging a first portion of said guide pin, and said second portion comprising a second alignment member for engaging a second portion of said guide pin.

13. (Withdrawn) A tool in accordance with Claim 10 wherein each of said first and second portions comprises modular blocks, at least some of said modular blocks being nonconductive.

14. (Withdrawn) A tool in accordance with Claim 10, at least one of said first portion and said second portion comprising a positioning plate, said positioning plate slidably engaged to a guide track to align the connector and the circuit board.

15. (Withdrawn) A tool in accordance with Claim 10 wherein said first actuator comprises an actuator block comprising a plurality of extraction pins.

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16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Previously Presented) The tool in accordance with claim 1, wherein said extraction mechanism includes front and rear support plates and a plurality of modular blocks mounted between and held stationary with respect to said front and rear support plates, said modular blocks being held stationary against the second surface of the circuit board, said actuator being movably held between said front and rear support plates and between said modular blocks.

23. (Currently Amended) The tool in accordance with claim 1, wherein said extraction mechanism includes front and rear support plates, said actuator including an actuator element, an actuator block and an extractor block located between the front and rear support plates, the actuator block being held stationary with respect to the front and rear support plates, the actuator element moving the actuator-extractor block toward and away from the second surface of the circuit board when the actuator element is rotated, the actuator-extractor block including the extraction pins.

24. (Currently Amended) ~~The tool in accordance with claim 1~~ A connector insertion and removal tool for inserting and removing an electrical connector onto and from a circuit board having opposite first and second surfaces, said tool comprising:

an installation mechanism configured to be positioned proximate the first surface of the circuit board, the installation mechanism being configured to insert the connector onto the first surface of the circuit board; and

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an extraction mechanism configured to be positioned proximate the second surface of the circuit board, the extraction mechanism being configured to remove the connector from the first surface of the circuit board, said installation and extraction mechanisms being coupled to one another;

wherein at least one of said installation and extraction mechanisms comprises an actuator adapted for movement toward and away from the circuit board to insert and remove the connector onto and from the circuit board, said actuator comprising a plurality of extraction pins that are configured to align with a pin aperture field that is included on the second surface of the circuit board, the extraction pins extending into the pin aperture field to force the connector from the first surface of the circuit board, wherein said extraction mechanism includes front and rear support plates and a board guide pin securing said extraction and installation mechanisms to one another, the actuator including an actuator element and an extractor block, the actuator element moving the actuator block toward and away from the second surface of the circuit board when the actuator element is rotated, the actuator block including the extraction pins.

25. (New) The tool in accordance with claim 1, further comprising a board guide pin that secures the installation and extraction mechanisms to one another with the circuit board supported therebetween, such that the installation and extraction mechanisms prevent flexure of the circuit board while inserting and removing the connector onto and from the circuit board.

26. (New) The tool in accordance with claim 1, wherein the installation and extraction mechanisms simultaneously engage and support the opposite first and second surfaces of the circuit board.

27. (New) The tool in accordance with claim 1, further comprising guide pins that extend through guide openings in the circuit board, and securing elements threaded on the guide pins to secure the both installation and extraction mechanisms to the circuit board.